

BEES FROM COASTAL NORTHERN CALIFORNIA

BY CHARLES D. MICHENER

Pasadena, California

Prof. T. D. A. Cockerell, in a paper written at about the same time as this, has discussed numerous bees which he collected in the Redwood region, as well as some from the collections of the California Academy of Sciences. Those from the latter source not used by Cockerell were turned over to me, and this paper is based on studies of some of these specimens. It is to be hoped that eventually, as the bee fauna of the Redwood area becomes well known, some idea of the effect of the peculiar flora of this region upon the bees may be reached.

Thanks are due to Mr. E. P. Van Duzee for the loan of these specimens and for cooperation in matters of publication. I especially wish to express my thanks to Professor Cockerell for enabling me to study these bees, and for many helpful suggestions made throughout the preparation of this paper.

Types of the new species will be found in the collection of the California Academy of Sciences.

SPINOLIELLA ANTHIDIUS (Fowler)

Male: Guerneville, Sonoma County, May 21, 1910, (Van Dyke).

The *Panurginus* described below are all forms which lack yellow markings in the males, as well as in the females. A key to these and other black-faced forms will be given in a forthcoming paper.

Panurginus maritimus Michener, n. sp.

Male (type): Length 7 mm.; black, the apices of mandibles ferruginous; under side of flagellum pinkish brown beyond second joint, the first longer than second or third; mandibles not unusually long, that on one side reaching to the far side of the labrum (In *melanocephalus* Ckll. the mandibles are slightly shorter than this); eyes somewhat convergent below, the head much wider than long; wings very pale milky brown, the stigma pale brown, the first recurrent vein a little distad to first transverse cubital; head and thorax faintly shining, mostly finely lineolate, with very few, very minute punctures, the posterior half of scutum more shiny than elsewhere and hardly lineolate; tegulae shining black;

abdomen distinctly shining, faintly lineolate, impunctate; process of sixth sternite somewhat like *melanocephalus* Ckll. (see Crawford's figure of *morrisoni* Cwfd.) but not definitely preapical; pubescence pale, that of clypeus fuscous mixed with black, that of front pale fuscous; clypeus practically punctureless, its emargination normal.

Point Reyes, Marin County, March 22, 1925 (H. H. Keifer).

Readily distinguished from other black-faced males by the color of the wings and antennæ.

Panurginus emarginatus Michener, n. sp.

Male (type): Length about 5 mm.; black, rather slender; head much broader than long, the eyes converging below; mandibles slightly reddish at apices, about as long as in *melanocephalus*, a little shorter than in *maritimus*; first joint of flagellum considerably longer than second, a little longer than third; head and thorax slightly shining, very finely lineolate, most shiny on post-scutellum, scutellum, and most of scutum; punctures very few and fine; abdomen quite shiny; wings nearly clear, the veins and stigma black, the first recurrent slightly basad to first transverse cubital; process of sixth sternite fairly broad, emarginate at apex, rather long, though not as long as in *atriceps* (Cress.); emargination of clypeus quite deep as usual; pubescence of head and thorax black, the front and dorsum of thorax with some pale hair, the venter of thorax with hair mostly pale; legs and abdomen with pale hair.

Female: Length 6 mm.; similar to male; clypeus with a few more punctures, but they are quite fine; pubescence of head and thorax mostly fuscous, with black on clypeus.

One of each sex from Meyers, 5 miles north of Miranda, Humboldt County, April 18, 1935, on *Ranunculus* (Van Duzee).

Smaller, with more shiny postscutellum than in the other black haired species, *nigrihirtus*. Mandibles shorter than in *nigrihirtus*.

Panurginus nigrihirtus Michener, n. sp.

Male (type): Length about 6½ mm.; black; head much broader than long, the cheeks quite broad; eyes converging below; clypeus deeply and broadly emarginate, as usual; mandibles quite long, that on one side extending beyond opposite side of labrum, their apices often slightly rufescent; first joint of flagellum longer than second, usually a little longer than third; head and thorax slightly shining, distinctly lineolate, the median apical part of clypeus

more shiny than rest of clypeus, the postscutellum duller than scutellum, about as dull as enclosure of propodeum; posterior part of scutum not much if any shinier than anterior part; tegulæ shining black; abdomen shining, lineolate; punctures of head, especially clypeus and lower sides of face, rather large and numerous (for this group); scutum with some fine punctures; wings slightly dusky, the veins and stigma black, the first recurrent vein meeting or slightly basad to first transverse cubital; process of apex of sixth sternite broad, with a broad emargination after the manner of Crawford's figure of *rowheri* Cwfd. (*bakeri* Cwfd. not Ckll.); pubescence of head and thorax black, mixed with a little pale on scutum, replaced by pale on venter of thorax; mandibles, scape, legs, and abdomen with mostly pale hair.

Female: Length nearly 7 mm.; similar to male but face with more and coarser punctures; scutum not or hardly lineolate; pubescence paler, the clypeus with at least some black hairs, the rest of face and dorsum of thorax usually with fuscous hair.

Pubescence of male largely black as in *emarginatus*. See notes under *emarginatus* for distinctions between these species.

Meyers, 5 miles north of Miranda, Humboldt County, April 18, 1935, on *Ranunculus* (Van Duzee).

Panurginus ceanothi Michener, n. sp.

Male (type): Length a little over 5.5 mm.; black, slender, form of *gracilis* Mich., head much broader than long, the eyes converging below; mandibles very long, rufescent at apices; head and thorax slightly shiny, faintly lineolate, the postscutellum as shiny as scutellum, the clypeus and sides of face with a few fine punctures, the scutum with still finer ones; abdomen quite shiny, slightly lineolate, with a few very fine punctures; process of sixth sternite fairly broad (wider than in *atrics* (Cress.) and rather long, emarginate at apex after the manner of *nigrihirtus*; apex of clypeus with the usual large emargination; wings hardly dusky, the veins and stigma black; pubescence pale, fuscous on clypeus.

Yorkville, Mendocino County, May 8, 1935, on white *Ceanothus* (Van Duzee).

Gracilis Mich. (which will be published elsewhere), is the other pale-haired, small species with dark head, antennæ, and legs. It, however, has a very shallow emargination on clypeus.

PANURGINUS NIGRELLUS Crawford

Lagunitas, Marin County, March 29, 1908 (Van Dyke); Mark West Springs, April 23, 1935, on *Nemophila tricolor* (Van

Duzee). The above records are for males (many females also from Mark West Springs). Two females from Cazadero, April 13, 1918, (Van Duzee) are probably this species.

Female: Length usually not quite 7 mm.; similar to the male but punctures of clypeus usually slightly larger; pubescence (as in male) pale with black or fuscous on clypeus and sometimes on lower part of front.

PANURGINUS MELANOCEPHALUS Cockerell.

Fort Baker, Marin County, March 15, 1925 (C. L. Fox); Mill Valley, Marin County, March 15, 1925 (H. H. Keifer); Fairfax, April 13, 1919 (Van Duzee).

PANURGINUS OCCIDENTALIS (Crawford)

Males: Ben Bow Club, Humboldt County, April 19, 1935, on *Limnanthes douglasii* (Van Duzee, Coll.).

Female: Yorkville, Mendocino County, May 1, 1924 (Van Duzee).

Halictoides californicus Michener, n. sp.

Male (type): Length 5 mm.; bluegreen, the head blue, the clypeus, legs, antennæ, and sternites black (thorax obscurely, and tergites very obscurely, metallic); head much wider than long; eyes converging below; antennæ quite long, black, the flagellum with a row of hooked hairs for its entire length, the hairs small, and about eight or nine per joint; tegulæ black; legs normal except that the hind tarsi are flattened, joints two to four with rather long processes on one side; clypeus densely hairy, apparently with rather deep punctures except on the upper margin which is smooth and polished; enclosure of propodeum strongly striate; punctures fairly small, not close except on front; posterior margins of tergites broadly hyaline; pubescence fairly abundant, pale ochraceous on dorsum of head and thorax, white on face, not covering face except for clypeus; forming distinct abdominal bands, dull white on cheeks and sides of thorax; wings rather brown, the veins and stigma black, the second abscissa of cubital vein shorter than fourth.

Yorkville, Mendocino County, May 1, 1924, and May 8, 1935 (Van Duzee).

Not closely related to any described species. Differs from *davidsoni* Ckll. and *oryx* Vier. by shorter, more robust form, smaller size, etc. Differs from all other small green species

known to me by the arrangement of the hooked hairs of the antennæ.

HESPERAPIS PELLUCIDUS Cockerell

Male: Ben Lomand, Santa Cruz Mountains, May 16, 1931 (Van Dyke).

EMPHOROPSIS DEPRESSA (Fowler)

Females: Garberville, Humboldt County, April 19, 1935 (Van Duzee).

Male: Mount Diablo, April 24, 1935, on *Salvia mellifera* (Van Duzee).

Anthophora simillima californiensis Michener, n. var.

Male (type): Length about 15 mm.; similar to the typical *simillima* Cress. but pubescence much darker, the pale pubescence, particularly that of sides and front of thorax, ochraceous; hair of vertex entirely black, that of front and sides of face mixed with black; hair of cheeks dark fuscous or black; hair of legs black, mixed with dark fulvous on fore and middle tarsi; hair of under side of thorax and pleura up to the middle black; scutum with much black hair intermixed; pale hair of abdomen confined to first tergite and basal half of second.

Female: Similar to typical *simillima* but hair of head black, with a little ochraceous in front of ocelli; hair of legs, venter of thorax, and lower half of pleuræ black; hair of dorsum of thorax ochraceous with much black; abdomen without light hair beyond first tergite.

Two males and a female from Yorkville, Mendocino County, May 17, 1929 (Van Duzee).

A male from Mark West Springs (recorded by Cockerell), is much like the Rocky Mountain (typical) form, the last two tergites showing some pale hair, the pleura and venter of thorax pale haired, but pale hair mostly ochraceous, and femora and parts of tibiæ black haired. Until I saw this last specimen I thought *californiensis* was surely a good subspecies, if not a species. I can see no difference in genitalia between these two forms.

The female is superficially very similar to *A. ursina* Cress., differing by the mixture of black hair on the scutum, etc.

ANTHOPHORA URBANA Cresson

Females: Fairfax, Marin County, June 5, 1921 (C. L. Fox).

Males: Cazadero, September 2, 1918 (Van Duzee).

ANTHOPORA ATERRIMA Cockerell

Females: Yorkville, Mendocina County, May 17, 1929 (Van Duzee).

ANTHOPHORA EDWARDSII Cresson

Male: Mount Diablo, April 24, 1935, on *Salvia mellifera* (Van Duzee).

ANTHOPHORA PACIFICA Cresson

Female (*A. ignava* Cress.); 4 miles north of Laytonville, April 19, 1935 (Van Duzee).

DIADASIA BITUBERCULATA (Cresson)

Males: Fairfax, Marin County, May 22, 1921 (C. L. Fox).

Females: Mill Valley, Marin County, June 21, 1935 (Slevin).

DIADASIA NIGRIFRONS NEREA (Fowler)

Female: Guerneville, Sonoma County, May 31, 1910 (Van Dyke).

Osmia gracilis Michener, n. sp.

Female (type): Length nearly 6 mm. black, nonmetallic, the labrum, under side of flagellum, and parts of tegulæ dark brown; mandibles tridentate; maxillary palpi five jointed; apex of clypeus faintly emarginate in the middle; eyes converging below; facial line longer than transfacial; notauli linear; enclosure of propodeum somewhat rough but shining; head and thorax densely punctate, the punctures coarsest on clypeus; wings quite brown, the basal vein with a tendency to be beyond transverse median, the second abscissa of cubital vein slightly longer than fourth, the second submarginal cell much narrowed above (as in *exigua* Cress.); first tergite with a sulcus but no carina above it; abdomen with rather fine punctures; apical margin of fifth tergite reddish; pubescence dull white, sparse, nowhere covering surface; abdominal bands narrow, white, and broken (or worn off?) medianly; scopa dull white.

Mill Valley, Marin County, July 19, 1925 (Van Duzee). Runs to *Chelostoma minutum* Cwfd. or *Ashmeadiella coquilletti* Titus in Cockerell's key to California black *Osmias* (1935).

Osmia abdominalis Michener, n. sp.

Male (type): Length 10 mm.; form rather long, the abdomen parallel-sided; head and thorax yellow green, somewhat brassy, with a small blue area around ocelli; abdomen brassy green, the fifth tergite with strong coppery tints, the posterior margins of the tergites broadly blue, these edged posteriorly with purple; apex of sixth tergite purplish black, brown laterally; tegulae black, with a little green at the anterior ends; legs black, the fore and hind femora green; mandibles and antennae black; pubescence white, reddish on under side of tarsi; head broad, the transfacial line distinctly longer than the facial; head and thorax finely and densely punctate throughout, the scutellum with a narrow polished line; wings faintly brownish, the basal vein meeting the transverse median, the second abscissa of cubital vein about twice as long as fourth; sixth tergite unnotched, but produced, the apex very obscurely truncated, the sides sinuate, producing fairly conspicuous obtuse angles near base; seventh tergite with its teeth broad, not pointed, and close together; posterior margin of second and third sternites about straight, untoothed; fourth sternite larger than any of the others, and produced apically.

One from Yorkville, Mendocino County, May 17, 1929 (Van Duzee).

Superficially this is somewhat similar to *physariae* Ckll. which differs in many important structural characters, being an *Acanthosmoides*. *O. abdominalis* is really closest to *nemoris* Sandh., which is smaller and more robust, with the abdomen nearly all about the same color, the sides of sixth tergite less distinctly angulate, the second tergite larger than any of the others, etc.

OSMIA EUTRICHOSA Cockerell

A male from Fairfax, Marin County, April 12, 1921 (C. L. Fox), agrees with the type except that the hair is quite red and the coloration is green. Both fore and hind femora are greenish in this specimen, as well as in the type.

OSMIA LIGNARIA Say

Females: Fairfax, Marin County, April 12, 1928 (C. L. Fox); Yorkville, Mendocino County, May 8, 1935 (Van Duzee); Mill Valley, Marin County, April 19, 1928 (C. L. Fox); Cummings, Mendocino County, April 20, 1935, on *Ceanothus* (Van Duzee).

OSMIA GABRIELIS Cockerell

Female: Yorkville, Mendocino County, May 17, 1929 (Van Duzee).